JANUARY 1944

SOIL CONSERVATION

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

Contents

Page

COMMITTEE ON SEED PRODUCTION PROGRAM:
By Grover F. Brown 147

WALNUT FOR GUNSTOCKS:
By A. H. Crosby 149

PENAL FARM REBUILDS LIVES AND SOIL:
By Barrington King 152

BROWN CREEK DISTRICT GROWS UP TO FIGHT:
By E. B. Garrett 156

MUTUAL DRAINAGE ASSOCIATION SPEEDS FOOD PRODUCTION:
By Edwin Freyburger 164

FOR REFERENCE:
Compiled by Etta G. Rogers 167

WELLINGTON BRINK
EDITOR

Soil Conservation is issued monthly by Soil Conservation Service of the United States Department of Agriculture. Washington, D. C. The matter contained herein is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with the approval of the Director of the Budget. Soil Conservation seeks to supply to workers of the Department of Agriculture engaged in soil conservation activities, information of special help to them in the performance of their duties. Copies may also be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., 10 cents a copy, or by subscription at the rate of $1.00 per year, domestic; $1.50 per year, foreign. Postage stamps will not be accepted in payment.

SOIL CONSERVATION

CLAUDE R. WICKARD
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

VOL. IX • NO. 7 ISSUED MONTHLY BY THE SOIL CONSERVATION SERVICE, DEPARTMENT OF AGRICULTURE, WASHINGTON JANUARY • 1944

COMMITTEE ON SEED PRODUCTION PROGRAM

By GROVER F. BROWN

Secretary Wickard's famous statement that "Food Will Win the War and Write the Peace" is being better understood and appreciated by all people on both sides of the war. Every time a food ration coupon is torn out of a book, or a soldier opens his ration pack or answers the call to chow, or lease-lend food is distributed to the hungry victims of Axis domination, the importance of calories is evident. There is nothing like a full stomach to make the world look brighter—and home worth fighting for.

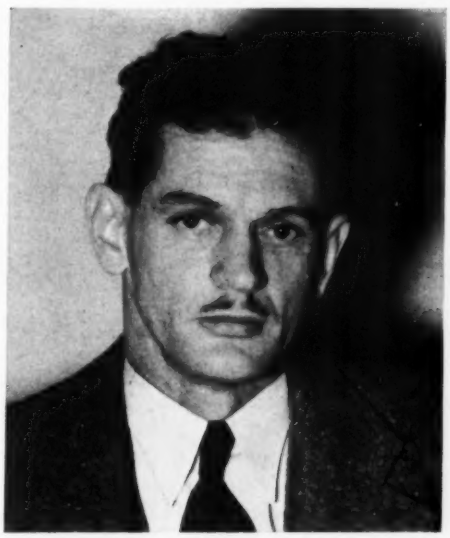
Milk, butter, cheese, eggs, meats, leather, and many other foods and food products depend on a plentiful supply of grass and legume seeds. Crop yields are largely in proportion to the amount and quality of the seeds used to establish the crops. High-yielding pastures can't be possible without a seed source of the best adapted grasses and legumes that go to make up the vegetative population.

Soil conservation is largely dependent upon the density of the vegetative ground cover, whether that cover be cotton, corn, potatoes, hay, or pasture. Land that is producing highest yields of any crop is doing so partly because it is protected from soil and water losses; at the same time, because of the high yields, there will automatically ensue less soil and water loss. Land that is producing maximum yields has such a heavy above-ground canopy and so many roots that the soil receives much more protection than it would from the production of a weakling crop.

It has become increasingly more evident that if adequate guidance and emphasis are to be given the Nation's seed programs, those in charge of such programs must have the best available advice and information. There are a number of agencies in the Department of Agriculture that have quite detailed and complete information on various phases but to bring such scattered parts of the picture together so that a

(Continued on page 160)

EDITOR'S NOTE.—The writer is assistant chief, division of agronomy. Soil Conservation Service, Washington, D. C.



Charles R. Enlow
Chief, Agronomy Division, Soil Conservation Service

Mr. Enlow has had a distinguished and colorful career. Probably no one knows more intimately the agriculture of the United States or the psychology of the American farmer. He was a flying officer-instructor in France in the first World War, is a valued advisor on agronomic problems connected with airfields in the second World War.

A key figure in the Nation's soil conservation program, Mr. Enlow enjoys an international reputation as an expert on grasses and legumes. In 1934 he hunted through Turkey and Turkistan in search of plants suited to erosion control on dry lands. In 1937 he participated in the International Grassland Congress in England, visited also Scotland, Wales, and France.

Mr. Enlow is a frequent contributor to scientific journals, and has also written for magazines of wide general circulation.

CONSERVATION BECOMES A HABIT

At the National Safety Congress recently held in Chicago, the southeastern region of the Soil Conservation Service was for the second successive year awarded a plaque in honor of having won the National Safety Council's annual passenger-car contest.

This region, with headquarters at Spartanburg, S. C., established the enviable record of having only 0.18 automotive accidents for each 100,000 miles driven by Government passenger cars during the year ending June 30, 1943. This accident frequency is considerably better than the rate of 0.22 accidents per 100,000 miles which won the contest in the previous year, and is equivalent to more than 180 cross country trips from coast to coast for each passenger car accident which occurred.

On learning of the award, Secretary Wickard expressed his satisfaction in a memorandum addressed to Dr. Bennett:

A number of factors must be considered in any attempt to evaluate the true worth of such an achievement to the Department and to the Government service as a whole.

First, vehicle accidents have been the cause of the greatest number of serious and fatal injuries to employees for many years. Achieving the lowest accident rate for passenger cars in the eastern territory means that losses of manpower, equipment, money and materials have been prevented.

Second, the awards have been won in competition with fleets in private industry, thereby enhancing Department prestige as well as that of all Government service.

Third, the awards have been won during a time when there was a large turn-over in maintenance-men and drivers.

Fourth, winning the award in 2 consecutive years proves that they have been justly earned by hard work and close attention to a well organized safety program.

I wish to congratulate you and every person in your organization having a part in this achievement and express a hope that this high rating will be maintained. Never before was the conservation of manpower, equipment, and material so important.

A FIRST CLASS IDEA, TOO

Johnnie Overman, 22, is a first class seaman at the U. S. Destroyer Base at San Diego, Calif., right now. But when Johnnie comes marching home to Baldwin County, Ga., after his present job is over, he's going to be a first-class farmer, and you may lay to that.

Johnnie's father, John Overman, Sr., bought a 200-acre farm recently with the idea of letting Johnnie take over when he came home. But Johnnie, who had spent 18 months in a CCC camp before he entered the service, wrote back that if he were going to operate the farm he wanted to do it his own way and didn't want any one-crop cotton farming.

So Mr. Overman worked out a farm plan with the assistance of the Piedmont Soil Conservation District which emphasized the production of feed and development of improved pastures to provide a sound basis for livestock farming. A copy of the plan, signed by Mr. Overman, was sent to Johnnie for his approval, and Johnnie signed on the dotted line.

A NEW FISHPOND BULLETIN

Just off the Government press is Miscellaneous Publication No. 528, Techniques of Fishpond Management. Written by Lawrence V. Compton, once associate biologist in region 6, now second lieutenant, U. S. Army Engineers, this 22-page publication represents the first printed review of the pertinent literature on fish farming as practiced in this country. Here for the land manager and progressive farmer are gathered together in summary form information about species of fish best adapted to pond conditions, rates of stocking, kinds of pond water fertilizers, both commercial and organic, and other notes on what is known about the subject. Tabulations and photographic illustrations, together with a bibliography, help to make the publication of unusual aid to the technician who wishes to obtain a background for productively integrating fish management in ponds and reservoirs with other phases of complete conservation plans for American farms and ranches.

Walnut for Gunstocks

The best log shipped to market from the forestry project during the year—13 feet long, 33 inches in diameter. It brought the farmer $202.52.

By A. H. CROSBY

Many forest products are classed as critical for war, but black walnut, because of its value for gunstocks, probably heads the list. It holds its position because all of the great discoveries in wood utilization and plastics during the quarter-century since World War I have failed to develop a satisfactory substitute for walnut for gunstocks.

So, today walnut is sought again in tremendous quantities for gunstock material, a hunt made no easier by the 25 years of unsystematic management and marketing which has been the rule since the last war. Its high place among the fine furniture woods led to the continued exploitation of the walnut supply; permitted it no opportunity to recoup after the inroads of wartime cutting.

Getting the walnut to market in quantities needed at present is not easy. Except where they have been planted, walnut trees do not occur in pure stands. Instead, they are scattered among the native timber in farm woodlands throughout the eastern United States. This story is applicable to woodlands along the Missouri River and its tributaries in southeastern and central Nebraska, and in eastern Kansas. Most of the walnut found today is second-growth.

The scattered stands and diffused ownership have made buying costs high. The prices usually offered to the farmer do not yield enough to make management of walnut seem worth while to a man busy raising cultivated crops. Buyers, who were in effect middlemen, have scouted out desirable trees, then offered the farmer a lump sum low enough to enable them to sell to the mills at a good profit. Under this hit-and-miss marketing system, there is little incentive except patriotism for the farmer to try to get his walnut to market, and his patriotism is under full test anyway in meeting the wartime food requirements.

Consequently, one of the important war jobs the Soil Conservation Service is doing in the walnut country along the Missouri River is in connection with the farm forestry projects, where good management and systematic marketing are being brought to the fore, and where sellers and buyers are being brought together in a way beneficial to both. It is admitted that the area covered by the projects is limited, but their influence is spreading.

EDITOR'S NOTE.—The author is farm forester, Soil Conservation Service, Humboldt, Nebr.

The progress made in the farm forestry project in Richardson and Pawnee Counties, Nebr., is indicative of what is happening.

It is doubtful if anyone knows today how much walnut remains in the Great Plains Region. Certainly there were considerable quantities, but the early settlers used much for rough lumber, fence posts and fuel. Still more was destroyed in land clearing. Since then, walnut has been cut pretty generally wherever it was found and the farmer was willing to accept the price offered. No supervision was exercised over cutting, and many small trees which by now would have yielded good timber were sacrificed.

Probably the most important effect of such practices is to make the management of the leftover species unprofitable and hence farm woodland management has made little progress in this section. Walnut represents the cream of the crop. If managed as one species in a mixed stand of oak, ash, basswood, elm, and boxelder, the cutting of all these species along with the walnut as they become ripe is not only possible but profitable. The big money tree is, of course, walnut. The associated species make excellent lumber for farm and local market use and provide posts and fuel. Walnut management is therefore the key to woodland management wherever it grows.

So far as the Nebraska farm forestry project is concerned, the farmers now have a fairly definite knowledge of their walnut timber resources. Conceding that the amounts within the project are representative of the rest of the walnut-producing area, this part of the country can furnish its share of the walnut needed for gunstocks and still have young trees coming along to meet future requirements. That is, if good management is practiced.

Besides ascertaining the amount of walnut—and other commercial timber as well—in the project, the Soil Conservation Service foresters also had to find out the names and locations of all industries using walnut logs and lumber; types of product and costs and methods of manufacture; marketable sizes and grades of logs and unit prices; and costs of logging, hauling, trucking, loading and freight. These ascertained, a fair value could be set on stumpage.

It is interesting to note that walnut mill operators, at first reluctant to furnish information, are now cooperators. Their representatives are frequent callers at the project office, seeking information about the industry and assistance in making the purchase of trees. It was these people from whom the information about costs had to be acquired in the first place, for farmers who had sold walnut logs had little idea of the unit prices they received.

One of the better walnut trees sold in the Nebraska farm forestry project in 1943. Its appraised value to the farmer was in excess of $160.

With the early work of the project out of the way—that is, the starting of demonstrations in management methods—the assistance given to walnut owners is now standardized. The owner and the farm forester together decide the trees to be sold, blaze and number them, and compute the value of each tree individually. The values are figured on the mill prices for logs, from which are subtracted the costs of logging, hauling, loading, and freight. A reasonable profit is figured for the logger, and in ordinary times the farmer can take advantage of this by logging his own trees. Because of the present shortage of farm labor, however, logging is done by special crews.

Having a close estimate of the volume of timber for sale, and a knowledge of its value, the seller is in a position to contact interested buyers, a list of whom is maintained at the project office. Ordinarily, three to five bids are secured with the price offered by at least one in line with the appraised value. Sales are usually made on a lump-sum basis, but since the volume is known and the trees marked, there is actually little difference between this method and selling at so much per thousand board feet.

In this way, the farmer realizes a fair return from his trees and the mills' buying costs are reduced ma-

terially by eliminating the necessity of scouting for marketable trees. In a number of sales arranged by the project in the last year, the prices have been considerably above the appraised value. This is due to need for walnut by manufacturers with war contracts and the difficulty in locating supplies and getting them logged.

The farm forester has already helped 51 farmers in the project, cruising 846 acres and appraising 2,297 walnut trees, containing 340,700 board feet. The appraised value was $22,377.97, or an average of $62.74 per thousand board feet on the stump. Average lumber content per tree was 151 board feet, with a value of $9.74.

An average run of good, clean walnut logs harvested in the forestry project and ready for loading.

Even these smaller, crooked walnut logs have a value of $25 per thousand board feet in the standing tree, and make thinning and the removal of trees of lower quality well worth while.

With the butt log of this walnut tree worth $290 per thousand board feet, a few hours' digging to get the extra length was profitable.

The outstanding sale in 1943, however, involved what is said to be the last remaining virgin stand of walnut in the Middle West and one of the last in the entire country. Situated on the Caleb Callam estate in Pawnee county, the 71 acres on which the sale was made had been owned by the Callams for 60 years. The owners of this timber were not cooperators in the farm forestry project, but the methods which had been demonstrated were followed.

The 195 trees that were sold brought $11,600, an average of nearly $60 per tree, with individuals ranging from $8 to $10 to well over $250. An estimated 80 thousand board feet of logs were shipped with the most valuable log (33 inches by 13 feet) bringing more than $200. Bidding was spirited, with every walnut industry in nearby states anxious to secure these excellent trees.

The Callam sale is important, too, for other reasons. It indicates the possibilities of walnut growing in southeastern Nebraska, although it must be admitted that this was above the average that may be expected. It also shows that the management practices encouraged by the farm forester are taking hold. The Callams sold 195 trees, but equally important, they left in the stand more than 300 of the younger thriftier trees even though they are of commercial size and have an appraised value of more than $5,000.

It has been found that the ability to place a definite value on the smaller trees gives the farmers understandable reasons for keeping them and caring for them. The remaining Callam trees will be marketed later, after they have increased their diameters and consequently can yield a larger percentage of high quality lumber. The increase will be in both quantity and quality.

(Continued on page 166)

PENAL FARM REBUILDS LIVES AND SOIL

Harvesting squash from a 5-acre plot planted in July.

By BARRINGTON KING

Crime, according to J. Edgar Hoover, chief of the Federal Bureau of Investigation, costs the United States an estimated $15,000,000,000 a year. Misuse of land, according to H. H. Bennett, chief of the Soil Conservation Service of the U. S. Department of Agriculture, costs another $3,844,000,000. Aside from the immediate problems of war and the peace to follow, therefore, rehabilitation of misdirected lives and conservation of misused land are two of the principal economic problems facing the Nation today.

Oddly enough, at the Shelby County Penal Farm near Memphis, Tenn., where these two apparently dissimilar problems are being tackled together, it has been found that there is a striking similarity between the rehabilitation of misdirected lives and the conservation of misused land. The basic principle of the whole penal farm program consists of putting every man and every acre to work at the job which the man and the land are best suited to perform.

O. B. Ellis, commissioner of the penal farm, roads, and bridges on the Shelby County Commission, believes that the chief reason for the vast amount of eroded, worn-out land in the South today is the extensive use that has been made of steep, erodible land growing clean-tilled crops like cotton and corn. The remedy, he contends, is to keep that kind of land in pasture, close-growing forage crops, or trees, and to use only the moderately sloping or level areas—protected by adequate soil conservation measures—for producing clean-tilled crops. This principle of sound land use is the basis of the soil conservation program in operation on the Shelby County Penal Farm.

The job of human conservation is being approached similarly. The first step when a new pris-

EDITOR'S NOTE.—The writer is head of the current information section, Soil Conservation Service, Spartanburg, S. C.

Hereford cattle at one of the nine water-storage ponds.

W. B. Ellis.

Dairy herd on Shelby County Penal Farm.

E. W. Hale.

Aberdeen-Angus cattle grazing on supplemental pasture.

562848—44——2

oner comes to the penal farm is to determine just what kind of work he is best fitted to perform. After a complete physical examination, Ellis interviews the prisoners one at a time, asking them about jobs they have held, the kind of work they like to do best, what their interests are, and other questions to bring out information about the background of each prisoner that might throw light on his aptitudes and interests. From the notes Ellis takes during the interview, his secretary writes individual letters to all former employers, asking them about the prisoner's attitude, skills, etc.

"We tell them the offense of which the prisoner has been convicted and what his sentence is, and explain that we are trying to get this man back on the right track. Then we ask them to give us all the information they can to help us do a good job," Ellis relates. "You'd be surprised at the responses. The people we write to usually take a genuine interest in trying to do something for these men. They not only give us all the information they can of their own knowledge, but frequently go out of their way to ask other people for additional facts that might be helpful.

"From our personal interviews of prisoners and the information we get from former employers and others, we gain a good idea of the kind of job each man can do best," Ellis continues. "And in the operation of a farm as big as this one, we have a wide variety of jobs from which to choose. Among them are general farm work, tending dairy cattle, beef cattle, and hogs, welding, woodworking, plumbing, heating, electrical work, painting, auto mechanics, and a variety of specialized jobs involved in these various types of work."

The present penal farm, Ellis explains, represents the culmination of a dream of E. W. Hale, chairman and for 32 years a member of the Shelby County Commission, which is the governing body of Shelby County. It was Hale's idea to replace the old county workhouse in Memphis with a farm that would provide a variety of activities for prisoners. Out of this idea has grown the plan for rehabilitation of prisoners through work they are best suited to perform, and application of this same principle of rehabilitation to the land.

The penal farm, Mr. Ellis says, is just one of many outstanding jobs that Mr. Hale has accomplished during his 32 years as head of the county government. Shelby County schools are nationally recognized as outstanding in rural education. The county has more miles of "black top" roads than all the rest of Tennessee combined, exclusive of the State highway system. The Memphis and Shelby County Health Department has won the national award for the past 4 years in the National Health Conservation Contest. The net bonded indebtedness of the county at the present time is only $3,442,093.02, Ellis reports.

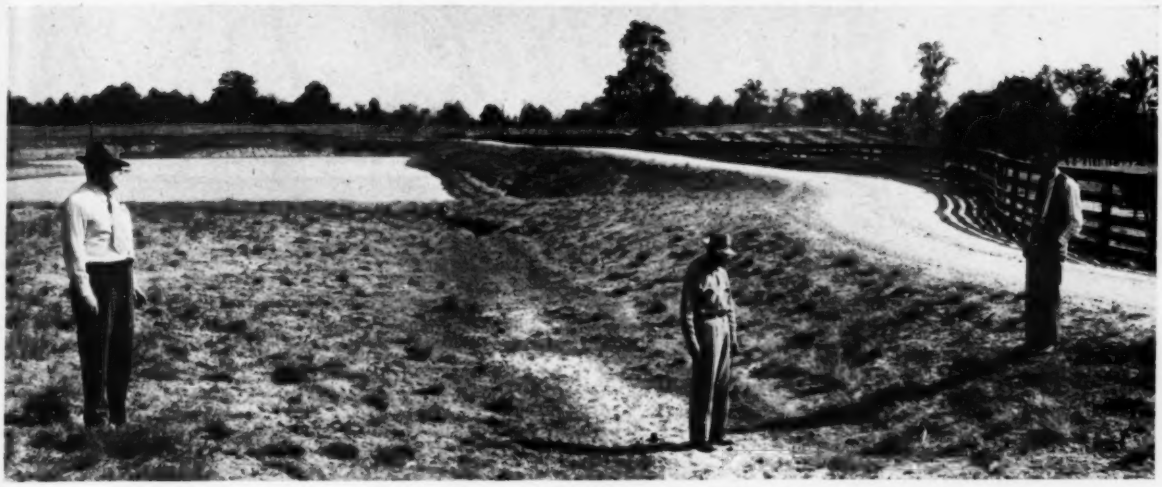
In 1928 first 2,000 acres of land for the penal farm was purchased, and the main prison unit built, through a million dollar bond issue. The land consisted largely of worn-out cotton farms. The first job that confronted county officials was to convert these eroded, run-down farms into productive land through diversified farming and a sound soil-building program. From time to time additional land was purchased and the plant expanded. The penal farm now comprises 4,600 acres and the land and improvements are valued at $2,500,000. Ellis attributes the efficient operation of the farm largely to Tom Hooker, farm manager, and Wallace Bryan, dairy and livestock manager.

Something of the scope of present operations is indicated by the fact that the farm now carries 1,000 beef cattle, 225 dairy cows, and 3,400 hogs. Grazing for the cattle and other livestock is furnished by 1,000 acres of permanent pastures on the steeper areas of the farm and 500 acres of rotation pastures on the lowland areas. Another 1,500 acres of bottomland, along the Wolf River, is used for corn, alfalfa, and silage crops, including sorghum and soybeans. About 700 acres are in woodland, which furnishes lumber for farm building and woodworking jobs. The remaining land is devoted largely to hay, supplemental grazing, and vegetable crops.

Sixty Jersey cows and two bulls imported from the Island of Jersey in 1934 at a cost of $34,000 were the foundation of the present herd of 225 dairy cattle. This "extravagant expenditure of taxpayers' money" was severely criticized in 1934, but since that time more than $85,000 worth of bull calves have been sold into 42 States and the herd today is valued at more than $100,000. The day before our visit the farm sold an unborn calf from parents with outstanding pedigrees for $1,000.

The 1,000 beef cattle include 96 registered Aberdeen-Angus and purebred and grade Herefords. The 3,400 hogs include Duroc, Hampshires, and Ohio Improved Chester breeds. The farm keeps several jacks and 50 Percheron brood mares and raises its own mule colts. Some 60 mules are kept on the farm, along with the brood mares, for work stock, and seven tractors are also used in the farming operations.

The farm has a trench silo, capacity 1,700 tons. It is a concrete trench 260 feet long, 25 feet deep, 17 feet wide, surmounted by a substantial frame building to protect it against weather. The corn, sorghum, and soybeans produced on 250 acres of crop land are harvested green, run through a silage cutter, and blown into the huge trench to provide vitamin-rich, high-



One of the waterways through which water from terraces is conducted into the series of storage ponds.

protein winter feed for the farm livestock. A sign beside the building proclaims it as "the world's largest trench silo."

"If you find a bigger one, let me know and we'll put on an extension," Ellis said.

On a somewhat comparable scale is the farm's sweetpotato curing house—capacity 35,000 bushels. Two crews were busy harvesting and storing potatoes in mid-October. A dehydrating plant, built by the prisoners themselves 4 years ago, before the war made dehydrating popular, is operating in connection with the central heating system. It has a capacity of 150 bushels at a run. A cold storage plant is used for storing apples, onions, peppers, Irish potatoes, cabbage, squash, egg plant, cucumbers, and other produce. Surplus beans are kept there until enough have been accumulated for a dehydrating run.

Victory gardeners who patriotically tended a tenth or a twentieth of an acre of vegetables last year will have a pretty good idea of what it means to care for some 250 acres the penal farm has in truck and vegetable crops. Thirty-five different varieties of vegetables are grown and, in addition to furnishing fresh vegetables for the penal farm and the county hospital, every month in the year except January and February, the farm sells up to $300 worth of vegetables a day on the Memphis market from 100 acres of land irrigated during the late summer, when most other local vegetables fail as a result of dry weather.

Virtually every phase of modern farming operations is demonstrated on the farm and inspection tours are regularly held. Recently the son of President Vargas of Brazil, and several ranchers from Argentina and other South American countries, have been among the visitors. Many U. S. Department

Tomatoes in mid-October on part of the irrigated garden.

of Agriculture officials have visited the farm. The Extension Services of Tennessee and adjoining States, Farm Bureaus, 4–H Clubs, Future Farmer and county agent groups frequently hold tours and field days there. The National Duroc Congress was held at the farm in July, with 1,500 persons attending. Hogs were entered in the event from 24 States and 100 gilts were sold at an average price of $240, with a top price of $2,100.

Hog raising is an important activity and an average of a carload of hogs a week is shipped, in addition to those slaughtered for use on the farm. The two large concrete-floored farrowing barns, which serve as "maternity hospitals" for the hog population, contain 60 individual pens with adjoining concrete-floored runs outside. In one corner of each pen, under a low shelf, a 100-watt electric bulb pro-

(Continued on page 161)

Brown Creek Distric

Milking time on the farm of Adam Lockhart, near Wadesboro. Mr. Lockhart has more than 100 registered Jerseys, an equal number of registered Herefords.

Two acres of kudzu had fu[r]ished grazing for 17 cows, 3 mare[s] colt[s] m[i]le.

By E. B. GARRETT

A lot of changes have taken place in the five-country area around Wadesboro since the Brown Creek Soil Conservation District was granted a State certificate of organization on August 4, 1937, and became the first farmer-organized, farmer-operated soil conservation district in the United States.

Fields that had washed away under continuous row cropping on land too steep for cultivation have been converted to perennial hay crops of kudzu or sericea lespedeza. Terraces, contour tillage, and improved rotations have been set up on more gently sloping land. Lespedeza in the heavier soils and crotalaria on the sandy areas, along with winter legumes and small grain, are restoring organic matter and fertility to worn out land.

Improvement of permanent pastures has kept pace with the increased production of hay and supplemental grazing provided by small grain, winter legumes, and perennial crops and, with more feed available, district farmers have been able to increase production of hogs, cattle, poultry, and other livestock vital to the war program.

EDITOR'S NOTE.—The author is State conservationist, Soil Conservation Service, Raleigh, N. C.

County Agent J. W. Cameron, who took an active part in getting a demonstration project and CCC camp located in Anson County and later presenting information before the legislature which resulted in passage of the North Carolina districts law, under which the Brown Creek district was organized, sees the work of the district as an educational program, the benefits of which will extend over an indefinite period. But right now, the district is primarily concerned with helping to produce crops needed in the war program.

"If we have the soil in good shape, we can grow more war crops and grow them more economically," Cameron points out. "This is especially important now, with the shortage of labor. The more we conserve the soil, the more livestock we are going to produce. Livestock is fundamental to sound farming.

The same idea is expressed by Adam Lockhart, cashier of the Bank of Wadesboro. Lockhart sees livestock as the basis of all agriculture and as a means of keeping young people interested in farming.

"You can't keep young people excited about mechanical farming," he declares. "You've got to have livestock to tie them to the land."

On his own 3,000-acre farm, Mr. Lockhart has more than 200 registered Jerseys and Herefords. He

rict Grows Up To Fight

dzu had furnished 3 weeks' supplemental
ws, 3 mares, 2 colts when this picture was
ade.

A. D. Griggs with 8 of his Poland China and Hampshire brood sows in spring of 1943. He sold $4,000 worth of hogs and pigs in 1942, expected his sows to farrow 200 pigs in 1943.

brought the first Herefords to Anson County in 1911, from Kentucky, and gradually worked out of grade cattle into registered stock. He started with Jerseys in 1928 and 1929 "to keep his labor busy," he says. Although he operates a large dairy, he's still partial to beef cattle.

Mr. Lockhart can't tell you offhand exactly how many cows he has, except that there are over 100 each of Jerseys and Herefords, but he knows them all by name, and their grandparents, too! He can give the age of every cow on his farm. "I've got enough Scotch in me to make me love a cow."

There are some 1,500 acres under fence on Mr. Lockhart's farm, including 250 acres of open pasture and 150 acres of improved pasture. He says he has come to the conclusion that it's not worthwhile to put money into pasture improvement until you can do a thorough job of it. As a part of the district program, his pasture acreage is gradually being improved by liming, fertilizing, and seeding, with special emphasis on development of bottomlands.

We haven't appreciated nature's gift of the branch bottoms for pasture," he says. "We've got a lot of eroded land in Anson County, but there is a lot of undeveloped land along branches that will make as good pasture land as can be found anywhere, with adequate moisture even during dry seasons. "If you make a home for clovers and grasses, they'll stay there."

More than 1,200 farmers are now carrying out complete conservation plans on their farms as a part of the Brown Creek Soil Conservation district program. A survey of 51 farms that have been carrying out conservation plans for 2 years or more showed that the number of cattle on these farms had increased from 214 to 648 head, or more than 200 percent. At the same time, hogs increased from 341 to 560, or 64 percent, and poultry from 3,460 to 9,369, or 170 percent.

These increases in farm products essential to the war program were brought about, the survey shows, by the development of improved pasture and increased production of hay, corn, small grain, and other feed crops, as a result of improved land use and increased soil fertility from systematic rotations.

Improved pasture on the 51 farms has been increased from 161 to 659 acres, or approximately 310 percent. Perennial crops to provide hay and supplemental grazing have been increased from a total of 6 acres before conservation plans were developed to more than 200 acres at the time the survey was made.

Although the corn acreage on the 51 farms was re-

duced from 1,195 to 955 acres, the average yield per acre was increased from 18.9 to 25.6 bushels and the total yield from 22,560 to 24,406 bushels—or nearly 2,000 more bushels of corn on 240 fewer acres.

Similarly, the cotton acreage was reduced from 937 to 869 acres, while yields per acre were increased from 283 to 400 pounds of lint, and total yields from 531 to 695 bales.

"We've just begun to farm well under this new set-up," declares W. Henry Liles, of Wadesboro, chairman of the board of supervisors. "Farmers have bought tractors, tillers, disk plows, grain drills, and mowing machines since the conservation program got under way, and they are going into the cow and hog business. This has been a great help in the present situation, when labor required for row-crop farming is scarce and when livestock products are needed in the war program."

Mr. Liles' own farm is a good illustration of the change that is taking place. Five years ago he bought 500 acres of eroded land and began at once setting up a conservation program. With 200 acres of open land, he had 80 acres in oats, wheat, and barley this year and sowed lespedeza on all of the grain. Although he is still growing a good deal of cotton, Mr. Liles is shifting to livestock and plans to develop a herd of beef cattle.

He began raising hogs in January 1940 with one bred sow. Last winter and spring, between Christmas and the middle of April, he marketed $1,700 worth of hogs and pigs, including 35 fattened for market, 10 breeders, and the rest sold as pigs. He sold three of the hogs, weighing 1,820 pounds, for $261.93. He recently paid $150 for a boar that won first prize at the Illinois Hampshire show last fall and will breed him on his eight registered sows.

A. D. Griggs, of Morven, route 2, has been increasing his livestock for several years. Three years ago he had six brood sows, which he has now increased to 20. He also has a Hereford bull, 12 Hereford cows, and 7 heifers. He started raising beef cattle and hogs to use the increased feed that he produced as a result of his conservation program, Griggs explains.

From the sale of hogs and pigs last year, he got an income of $4,000 and this year he sold $2,500 to $3,000 worth of hogs from Christmas to mid-April. He expects his sows to farrow 200 pigs this year.

Griggs bought his Hereford bull and 12 cows in October 1941. From 12 calves produced last spring, he sold 5 purebred bull calves this year at 1 year old for $200 each and kept the 7 heifers. In addition to his beef cattle, he has 3 Guernsey cows for home milk production.

Griggs has 375 acres of open land on his 525-acre farm and used to plant 250 acres of cotton. He has now reduced his cotton to 125 acres and plants 125 acres of grain. He uses vetch, oats, and barley for winter and spring grazing and cowpeas and soybeans for fall grazing. He has found that grain fields that are grazed until early spring produce about as much grain as they would if left ungrazed.

Griggs recalls that he began his conservation program as a result of a spring rain that nearly washed his farm away 4 years ago. More than 4 inches of rain fell in 2 hours, washing out crops, cutting gullies through his fields, damaging the farm to the extent of more than $2,000.

"It made me sick to see what had happened to my land," he says. "I didn't want to look at it, but finally I got on my horse and rode around over the farm. I had never seen anything like it and I decided that if a conservation program would prevent something like that from happening, I wanted all the conservation I could get. I told the boys in the district what I wanted and as soon as the crops were off the land, I began terracing my farm."

During the next 3 years, Griggs terraced his entire 375 acres of cropland, set up improved rotations, including small grain, summer and winter legumes, fenced his land to enable him to practice rotation grazing, and planted 3 acres of eroded land to kudzu. Two acres of the kudzu last year furnished 175 cow-days of grazing. He is developing a 20-acre permanent pasture by fertilizing and seeding to bluegrass, redtop, orchard grass, lespedeza, and white Dutch clover.

The conservation program has cut down the labor requirements on his farm and he has been able to reduce the number of workstock from 25 mules to 12 by adding a tractor to his equipment. With the terracing, fencing, rotations, and other conservation practices now established, he estimates the farm is worth at least a third more than it was when he began conservation.

In contrast to the larger farms of Liles and Griggs, W. A. Ingram of Lilesville has only 44.5 acres in his farm, and he has to make every acre count. The district program has helped him to do this through improved rotations and better land use.

On 38 acres of open land, he is carrying out a rotation of cotton, corn, wheat, oats, and lespedeza. He has 5 acres in sericea lespedeza and 3 acres in kudzu in a natural draw, which serves as an outlet for terraces on his cropland. An electric fence enables him to use the kudzu for temporary grazing to supplement the 2 acres of permanent pasture on his farm. He uses soybeans, small grain and winter legumes for additional supplemental grazing.

With more hay and grazing crops and increased

Combining wheat on farm of A. D. Griggs, Morven, N. C.

Field in contour strip rotation of cotton, corn, wheat, and lespedeza on farm of W. A. Ingram, Lilesville, N. C.

Henry Liles, chairman of the board of supervisors, takes a look at the barley in a 40-acre field on his farm near Wadesboro.

yields of grain, as a result of improved rotations, Ingram has been able to increase his cows from 1 to 5 and his brood sows from 1 to 3. His wife likes to look after the cows, and a good little income has been developed from the sale of dairy products.

They sell 12 pounds of butter a week at 40 cents a pound, or $4.80, and 15 gallons of buttermilk at 25 cents a gallon or $3.75, making a weekly income of $8.55 from milk products. In addition they sell about three calves a year, kill one or two for themselves. Last year Mr. Ingram sold 10 pigs at $7.50 each and this year they expected to sell 30 pigs at $10 each.

"We used to have to borrow money every spring to run the farm," Ingram notes. "Now, the milk and butter take care of everything but the fertilizer and the manure has cut down 25 to 30 percent on that."

In the sandhill section of Richmond County, crotalaria is performing near miracles by increasing crop yields through the addition of large amounts of organic matter and nitrogen to the sandy soil. The 128-acre farm of A. T. Hutchinson, Rockingham, route 3, offers a good example of this. When he bought the farm 7 years ago it was generally considered one of the poorest in that section.

Shortly after he moved there, Hutchinson lent his planter to W. B. Little, representative of the Soil Conservation Service, for a crotalaria planting demonstration in the neighborhood. Hutchinson got started growing crotalaria with a few seed that were left in the planter. He planted these in a small seed patch and produced 70 pounds of seed. He increased these to 2,500 pounds the next year and sold $230 worth of seed. All his land has been planted to crotalaria.

Last year Hutchinson made $1,570 from 3.8 acres of tobacco that had been in crotalaria 2 years before. From 2.7 acres of peanuts he harvested 2,800 pounds of nuts and 2,400 pounds of peanut hay, and he planted 10 acres of this important war crop this year. Corn yields on the farm have been increased from 10 to 30 bushels per acre.

When Hutchinson moved to the farm in 1936, after having lost two other farms he owned during the depression, the only livestock he had was one plug mule. He bought the farm from the Federal Land Bank on a 20-year-payment contract and the Farm Security Administration financed his operations the first 2 years. He has a complete conservation program, developed with assistance of the Brown Creek district.

As a part of his conservation program, Hutchinson has established 3 acres of improved pasture and has 10 acres in the process of improvement. He has 5 acres of kudzu for supplemental grazing and hay, and plants 6 acres of rye for annual grazing. He has 14 acres of cropland in a contour strip rotation of corn, small grain, cotton, small grain.

The improved pasture and grain and hay crops which he is producing have enabled this farmer to increase his livestock by adding 5 cows, 2 brood mares, and 4 hogs. Last year he raised 2 colts and 2 calves. He sold 7 pigs and hogs and killed 4 hogs for home use. He also has 65 blood-tested Hampshire Red laying hens.

"I figure this farm will produce twice as much as it would when I moved here," Hutchinson says.

Instead of taking 20 years to pay for the farm, he completed his payments last year, at the end of 6 years. He has also paid $1,000 on one of the other farms he lost, which he is buying back.

Tebe Shepherd, tenant on the farm of Dr. F. B. Garrett, near Rockingham, says he helped a former tenant harvest in two tow sacks all the corn produced in a 6-acre field. By using crotalaria for soil improvement, Tebe says he increased the yield on the same field to 27.4 bushels per acre. The land has been in wheat for the last 3 years and in 1942 he produced 125 bushels of wheat on the 6 acres.

The first year he came there, Tebe says, he put 20 acres in cotton and produced two bales weighing less than 500 pounds apiece. In 1942, he reports that he produced five good bales, weighing a total of 2,788 pounds, on 7.2 acres that had been in crotalaria.

The farm wasn't producing enough feed for 1 cow when he moved there, Tebe says, and he needed at least 2 cows to furnish milk for his 6 children. As a part of his district conservation program, he has developed 8 acres of pasture, including a combination stock and fish pond. He has 2 young cows and plans to increase his herd as rapidly as he can raise calves. He also has 2 small brood sows and sold 20 pigs last year for $215 and raised 3 for home use.

Lespedeza has been just as important on H. B. Andrews' farm near Mount Gilead as crotalaria has been in the sandhill section. Until 6 years ago there had never been a lespedeza seed on his farm. Andrews says that now he doesn't use anything but lespedeza for hay. Of 600 acres of open land, he has 150 acres in lespedeza each year. He cuts hay off the lowland areas, but doesn't take anything except seed off the hill land.

Under the district conservation plan he has taken 75 acres out of row crops and put in hay, pasture, and trees. He has reduced his corn by 50 acres and increased his small grain for feed. He has boosted his corn yield from 10 bushels to 25 per acre, and cotton from an average of 300 pounds to 450 per acre. In 1942, with a cotton allotment of 111.5 acres he made 107 bales. The conservation program has enabled Andrews to cut down on his labor and reduce the number of mules from 20 to 15.

"We used to buy 10 bags of hog feed a week and bought corn for the mules. Now we have feed for sale," he says. "Every family on the farm but two has a cow, and we have increased the number of hogs from 15 to 30. Last fall we made 1,200 gallons of molasses.

"Six years ago, the farm was about to wash away and I didn't know what to do about it. The hill land was just about gone. Now I don't worry about it any more and farming has become a pleasure instead of a drudgery."

Over in Union County, the farm of V. V. Secrest presents an outstanding example of the value of conservation farming. Secrest worked out his conservation plan with the assistance of the old CCC camp in that area and is continuing it under the district program. He was elected as one of the five supervisors when the district was organized and has served in that capacity ever since.

When he bought the farm his neighbors told him that it would "take a barrel of liquor and a brass band to raise a fuss on it," Secrest recalls, but apparently they hadn't taken into consideration what good land use, terraces, summer and winter cover crops, and systematic rotations could do to the soil in a few years. Land that produced only 3 bushels of wheat to the acre and took 5 acres to grow a bale of cotton, is now producing 50 bushels of corn, 30 to 35 bushels of wheat, and 50 to 75 bushels of oats.

It was the transformation that occurred on the Secrest farm that made Tom Broome, the dean of county agents of North Carolina, begin to wonder whether there actually was any such thing as submarginal land. He thinks that a lot of land that is considered "submarginal" can be brought back to productivity if it is put to the proper use and built up through sound farming practices. And that, he says, is vitally important as a part of the war program.

"Increased production has got to come through increased fertility," Broome declares. "I have sent out a letter to every farmer in Union County asking them not to have an idle acre on their farm—to put it all in food, feed, and grazing crops so as to help win this war as soon as possible."

COMMITTEE ON SEED PRODUCTION

(Continued from page 147)

sound policy can be put forward calls for a deal of thinking, work, and coordination.

The War Food Administration has long felt the need for a central source of data on the various questions on grass and legume seed—a means of marshalling every pertinent bit of information existing in the Department. Accordingly, J. B. Hutson, director of the Food Production Administration, has appointed a committee of representatives from the several interested branches in the Department, to formulate recommendations dealing with seed programs.

In appointing the Committee on Seed Production Programs, Mr. Hutson stated, "The providing of

adequate supplies of grass and legume seeds is one of the most difficult and important food production problems. This is especially true in connection with the maintenance of a high level of production over a period of years. Recently several suggestions have been made for strengthening this phase of our program and some changes have been made in existing programs to give added encouragement to seed production. It is probable that a concerted attack on the problem by all of the agencies concerned will disclose that additional measures can be adopted to advantage."

To obtain sound advice on such problems, Mr. Hutson has appointed a continuing committee with C. R. Enlow of the Soil Conservation Service as chairman. Other members are—

Joseph F. Cox, Production Programs Branch.

W. A. Davidson, Food Distribution Administration.

G. C. Edler, Bureau of Agricultural Economics.

O. S. Fisher, Extension Service.

M. A. Hein, Plant Industry, Soils, and Agricultural Engineering.

E. A. Hollowell, Plant Industry, Soils, and Agricultural Engineering.

M. M. Hoover, Soil Conservation Service.

E. A. Johnson, Production Programs Branch.

O. D. Klein, Agricultural Adjustment Agency.

C. J. McCormick, Commodity Credit Corporation.

W. A. Wheeler, Food Distribution Administration.

Mr. Hutson went further. He presented four problems of immediate importance, concerning which he wants the committee to develop recommendations:

1. Development of a comprehensive program for adequate seed production, including the increase of foundation stocks of high producing, adapted varieties.

2. Review of support and ceiling price programs as they affect seed production and utilization.

3. Technical assistance and recommendation of policy regarding the importation of seeds and the utilization of available supplies.

4. Obtaining reliable statistical data for use in establishing production goals.

Needless to say, there will be many more problems assigned to the committee for handling and Mr. Enlow has his work cut out to coordinate the recommendations of the different agencies and men represented on the committee. This is a real step forward in placing the value of conservation in the food production program of the nation in its important place. We will be looking for better planning and action in the solution of our future grass and legume seed problems.

PENAL FARM REBUILDS LIVES AND SOIL

(*Continued from page 155*)

Feeding time at the Duroc farrowing barn.

vides warmth for newly farrowed pigs. The farrowing barns, because of the mass production schedule on which they operate, are known as "Willow Run." During the previous week, Ellis told us, an average of 100 pigs a day were farrowed there.

When a litter is 3 or 4 weeks old, the sow and her pigs are transferred to one of a series of 60 outside runs, constructed on a steep hillside, to provide good drainage. These runs are kept planted to some grazing crop to provide green feed. The sow and her pigs are kept in these individual runs until the pigs are big enough to wean, when they are turned out on pasture with the other hogs.

"We are trying to make the hog a sanitary animal," Ellis tells visitors as they marvel at the cleanliness.

The jobs the prisoners do all represent productive work, the results of which they can see in the food they eat, the clothes they wear, and in virtually every other article they use in their daily lives, for the farm is almost entirely self-supporting. It makes its own ice, and operates its own laundry, maintains its own cold storage, slaughter, and dehydrating plants. Furniture is made in the woodworking shop from timber harvested in the 700 acres of woodland and processed in the farm's own sawmill. Women prisoners do the laundry, make the clothes which they and the other prisoners wear.

Among the shops on the perimeter of the central group of buildings is the repair shop used for repair of all county owned equipment—road machinery, farming implements, cars and trucks of the county health department, sheriff's office, and other departments of the county government. The penal farm also provides the labor for county roads. Metal bodies for the big trucks used to transport work crews to jobs on the roads or distant part of the farm are built by the prisoners. These trucks have specially built-in compartments for food, water, and tools, en-

abling the crews to remain on the job throughout the day. Many farm implements, such as wooden drag harrows and stalk cutters made from worn-out blades of road-grading machinery, are also produced in the shops.

Just as the farm itself typifies the agricultural phases of rural life, so does the central group of buildings present a small-scale model of an up-to-date urban community, drawing its sustenance from the surrounding farm land. In this combination of rural and urban activities, the prisoners have an opportunity to bring to clearer focus the complex relationships of human society. Where the job of every man and woman can be seen as an essential part of the community life, that job takes on added significance. When a prisoner begins to take pride in his own skill in doing a job at which he is proficient, the groundwork has been laid for his becoming a useful member of society.

"I wouldn't try to give you the idea that everything is rosy here," Ellis said as he took us through the various buildings where the prisoners were at work. "We have a lot of men who are tough when they come here and tough when they leave. But I don't say even they are hopeless. Maybe they are just cases where we fell down on the job. We have a lot of others who find themselves and get a new conception of their relationship to society while they're serving their time here.

"There's a boy right over there," he said as we entered the machine shop, "who could go out as a finished welder right now and make a hundred dollars a week. When he came here he had had no education or vocational training and had just drifted from one thing to another. Now he has mastered a trade and takes a pride in his work.

"The best prisoner we ever had," Ellis continued, "was a boy who was sent out here to serve a 10-year sentence for highway robbery. He was sour on the world, thought everybody was against him, and was out to get what he could, regardless of how he got it. Now his whole attitude has changed. He has become a first-class mechanic and is grateful for the training he's received. He has until August of next year before he'll be eligible for a parole, but I'd recommend him right now for any kind of mechanical job anywhere."

As you go with Ellis among the blue-denim clad prisoners inside and outside the spotlessly clean buildings and through the equally well-kept grounds, as you hear the prisoners talk to him like respectful employees, rather than prison inmates, as you hear him discuss farming operations, terracing, pasture development, truck gardens, cattle, hogs, silos, and barns, you begin to lose sight of the penal side of the institution and begin to realize more and more that you are seeing a very remarkable example of the operation of a highly efficient farm.

The whole undertaking, with its emphasis on rehabilitation of prisoners and conservation of land evident in almost every activity, might be considered a most unusual experiment, except for the fact that the institution last year showed a net operating profit of $100,000. An enterprise that operates on that kind of basis ordinarily is not classified as an experiment.

The average cost of operating all penal and eleemosynary institutions in the United States last year was $1.29 per person per day, Ellis points out. At that rate, the annual cost of operating Shelby County Penal Farm, with a present average of 500 prisoners, would be $240,000. Instead, an audit of the penal farm's books for the fiscal year ended August 31, 1943, showed a gross revenue of a quarter of a million dollars, an a net profit of $99,949.29.

In dealing with the crime of erosion, officials at the farm have recognized that the culprit is not the land itself, but the water that runs off sloping land and carries away fertile soil and plant food. Putting every acre to work at its proper job, therefore, will not alone solve the problem. The run-off water still has to be controlled and directed into useful channels. This has been accomplished here in a most ingenious manner by diverting surplus water from sloping fields into a series of nine ponds, connected by large diversion ditch 2.5 miles long. Water is stored in these ponds for irrigating truck crops during dry weather and for stock water in the upland pastures.

Before this water disposal system was developed, the runoff water from the hill lands poured down over the lower-lying areas, including 100 acres of land now used for growing vegetables and truck crops, and washed out gullies with every heavy or long continued rain. It also kept several hundred acres of bottom land too wet for cultivation. The first step toward control was to construct broad, channel-type terraces at intervals down the slope to trap the runoff from the area immediately above and divert it slowly out of the field. This series of terraces emptied into vegetated outlets through which the water was conducted into the series of ponds where it could be stored and utilized as needed.

The ponds provide a reservoir for all the water draining from 550 acres of land lying above. Water that is stored in one of the ponds during the winter months, which is the period of heaviest rainfall, is released as needed to irrigate the 100 acres of truck crops below during the late summer and fall, when droughts frequently occur. This pond has a maxi-

mum capacity of 113 acre-feet, or 37,000,000 gallons, and when full covers an area of 11 acres.

While this water disposal system, designed to take care of the surplus runoff water from the upland fields, is a fundamental part of the soil conservation program on the farm, a big part of the job also is done by pasture grasses that retard the flow of runoff water, protect the surface soil from erosion, and increase absorption of water by the soil. Absorption is further encouraged by subsoiling the pastures each fall with a chisel-like plow which opens up narrow slits in the soil to a depth of 18 inches, permitting the rainfall to soak deep into the group where it provides moisture for plant growth.

Erosion thus has been almost completely controlled by keeping the sloping land under a continuous cover of pasture sod or close-growing crops, using only the level or moderately sloping land for production of row crops, and combining this sound land use program with a complete water disposal system that controls and puts to productive use the surplus runoff water.

You get the idea in talking with Ellis that they don't accept the traditional methods of doing things on Shelby County Penal Farm. Here in the heart of the land of cotton is a 4,600-acre farm without a stalk of cotton on it. In a section where developing a pasture has traditionally consisted of putting a fence around an area of worn-out cotton land and turning in the work stock and a few scrub cows, is one of the finest Jersey herds in the world, grazing on pastures developed in accordance with the best experiment station recommendations.

Even the windmills with their blades spinning merrily in a lazy Indian summer breeze, presented a contradiction to the generally held belief that windmills won't work in that section of the country. Two windmills furnish water for cattle on all the lowland pastures and Ellis says that 36 hours is the longest period that occurs without sufficient breeze to keep the blades turning. With adequate storage capacity, plenty of water is available at all times.

In a region where huge levees parallel to the streams are the traditional method of protecting fertile delta lands from the fury of Ol' Man River, dikes have been constructed at right angles to Wolf River at intervals of a mile apart. These prevent the swift current from scouring off the topsoil during floods, but permit the water to overflow the bottomland and deposit fertile sediment in the ponded areas between the dikes. Floods usually come in March or earlier and rarely occur when summer crops are on the land, Ellis says.

Most of the bottomland used to be considered worthless, because it stayed too wet to cultivate and it had been allowed to grow up in willows and other scrub growth such as still covers similar land adjoining the penal farm. The willows and other trees were cleared out, a system of drainage ditches installed, and it is on this bottomland that most of the farm's row crops are grown—1,000 acres of corn, and 250 acres of sorghum, corn, and beans planted together for silage. This year the land made 60 bushels of hybrid corn to the acre and Ellis says he expects eventually to get the yield up to 100 bushels. As soon as the summer crops are harvested, the land is planted to oats and vetch for winter grazing and soil improvement.

In contrast to the bottomland areas, where the land is plowed and planted to corn, sorghum, and soybeans year after year, in rotation with small grain and winter legumes, a thousand acres of rolling land is kept in permanent pasture sod that protects the soil of these slopes against erosion. Another 500 acres of lower lying and moderately sloping land is in rotation pastures, which are plowed and planted to crops every few years and then reseeded to pasture grasses and legumes.

"We think we've got to study the personality of the land, just as we study the personality of the man," is the way Ellis sums up the conservation of human and soil resources on the Shelby County Penal Farm.

THE SOIL AND IZAAK WALTON

The relation between stream pollution control and soil conservation was graphically emphasized recently by Len Hofmann, president of the Indiana division of the Izaak Walton League of America, in an address before the Garden Clubs of America, November 10, New York City. Mr. Hofmann called for a five-point program "to make our waterways flow clear and pure once again." Conservation agencies, civic groups and service clubs were challenged to "direct cooperation with agricultural groups, urging and assisting in the formation of soil conservation districts to begin the necessary work of watershed control at the headwaters of our silted waterways." Other points in the proposed program revolved about an educational effort directed at the elimination of all types of stream pollution, legislation permitting States or a specially created agency to acquire rights-of-way for management of stream banks, local action to force adequate disposal of industrial wastes and municipal sewage, and the requirement that a municipality's eligibility for Federal funds in any post-war public works program be contingent upon construction of pollution control facilities.

MUTUAL DRAINAGE ASSOCIATION SPEEDS FOOD PRODUCTION

By EDWIN FREYBURGER

THE MUTUAL drainage association is proving to be a quick and effective solution to many drainage problems in some parts of the upper Mississippi valley region. Indiana has had particularly good success with this type of organization.

Informality of the mutual drainage association permits speedy action in getting land drained and in full production. It is especially desirable now as a means of boosting the yield of food for victory. An example of rapid results in drainage is provided by a group of farmers in Knox County, Ind., who organized an association last December and had ditch cleanout completed in time for a 1943 crop.

Legal procedure involving long delays and often legal costs of practically the same amount for a ditch cleanout as for the original construction has caused dissatisfaction in some states with legally established drainage districts. This dissatisfaction has led groups of farmers to organize mutual drainage associations whereby they could have their drainage facilities rehabilitated more quickly and with less expense.

Obviously, the successful operation of a mutual drainage association depends upon full understanding and agreement among all landowners as to what is to be done and as to cost. A mutual organization can operate only on this basis because there are no laws, such as are provided in the organization and operation of legal drainage districts, to force an individual or minority group to grant right-of-way and stand a share of the cost of improvement.

The mutual drainage association best meets the requirements of a few landowners who have no petty differences and who are willing to cooperate for the common good. Three to 12 constitute a desirable group. Larger numbers have been brought together, however, as in the case of the Roberson ditch near Wheatland, Ind., within the Knox County Soil Conservation District.

The Roberson ditch was last dredged as a court ditch during the summer of 1931 at a total cost of $15,933, including legal fees, engineers' costs, and other charges. Early in 1941 a meeting was arranged by interested landowners of the soil conservation district, to promote better agricultural conditions through a combination of erosion control and drainage. This meeting was led by the county agricultural agent, H. S. Benson, and was attended by a member of the soil conservation district technical staff. It resulted in preparation of an application for a survey of the Roberson ditch for owners of land abutting on it. When the soil conservation district supervisors received this application, they started a soil conservation survey which formed the basis for a land capability map of the area.

Thirteen landowners who met in December 1942 to discuss the capability map, preliminary survey data, and effects of erosion on drainage improvements formed a mutual drainage association and requested assistance from the soil conservation district in clearing lines so that an engineering survey could be completed. This request was granted and labor was supplied through the association.

On February 12, 1943, a second meeting was held with 20 landowners present, including representatives of a railroad and of the county highway supervisor. Complete plans and general specifications for ditch improvements were discussed, and a preliminary assessment roll was made on a total estimated cost of $8,500. A week later, another meeting listened to final specifications and plans, and adjustments of the assessment roll affecting 27 landowners, the Knox County Highway Department, Indiana State Highway Department, a coal company and a railroad. At this meeting the secretary-treasurer received over $2,000 in checks and cash. Arrangements were made to contact interested contractors and to collect money during the next 3 weeks. On March 17, 1943, a contract was let for moving 68,500 cubic yards of earth at a cost of $6,850. It was necessary for the contractor to do some clearing of right-of-way, for which he was to receive $950 additional, making a total cost of $7,800, about one-half the cost of the 1931 cleanout. In connection with the ditch rehabilitation, farm plans for erosion control were completed for 31 farms involving 4,085 acres adjacent to the ditch.

Work was begun March 24, 1943. Unusual weather conditions somewhat delayed the work, but indications are that landowners will receive benefits this first year which will more than pay the entire cost of the cleanout.

The Roberson job is a fairly typical example of the procedure followed in organizing a mutual drainage association in this region.

Organization of a mutual drainage association may require several meetings. It is initiated by a written or verbal application for assistance from interested landowners. Application is made to the soil

EDITOR'S NOTE.—The author is chief, regional engineering division, Soil Conservation Service, Milwaukee, Wis.

Two miles from mouth of Roberson ditch, looking upstream toward county road. This section is 10½ feet deep, 6 feet wide at bottom, 48 feet across top. The picture was made 1 month after excavation. Note distance of spoil from edge of bank.

conservation district governing body. If action appears desirable, the governing body may first appoint a committee to make an investigation and report back, or may immediately hold a meeting of interested landowners. If an initial meeting is held, all interested and affected landowners and tenants should be invited.

The first meeting should be opened by a district supervisor, a county agent, or a community leader as temporary chairman. If there is a county engineer, he should be there, and a Soil Conservation Service employee also should be present. A general discussion of the drainage problem will determine if there is sufficient interest to justify a preliminary or detailed survey, and will also bring out those problems that are particularly troublesome. If, in the opinion of the district governing body, there is sufficient interest and urgency, Soil Conservation Service personnel will discuss steps necessary to correct the drainage problem.

The conversation will embrace what other groups have done about similar problems, the assistance available through the soil conservation district, the advantages of an association, and the way a mutual drainage association is formed. An association may actually be formed at this time, or that step may be postponed to a later meeting. In order to obtain more detailed information for a subsequent conference, the district governing body should request landowners involved to grant ingress and egress to their properties by signing a formal request for a preliminary survey and estimate.

When preliminary plans and estimates have been completed another meeting is held. Progress to date is outlined by the chairman. If the preliminary survey and estimates are received favorably, the usual procedure is to form an association, if this yet remains to be done, to elect officers, and to draw up the articles of association.

The raising of money to defray the cost of work must then be decided. Various methods are employed, namely: (1) Voluntary contributions without regard to acreage or benefits. The success of this method depends on how urgently the tentative cooperators want the work done. (2) Equitable collections on the basis of old assessment rolls on court ditches. (3) Charges adjusted to benefits based on land capabalities. (4) Cost-sharing according to flat acreage.

Arrangements are made to notify everyone interested, by letter or in person, of the contribution required. Arrangements are made for some bank to hold the money in escrow. Experience has shown that actual construction should not be started until the money has been raised. A definite understanding should be reached relative to the authority of elected officers to accept bids, award contracts, and use association funds.

Following this method a detailed survey and estimate is made by technical representatives of the soil conservation district. When the detailed survey and estimates have been completed, it is presented to the officers of the association, who prepare a letter to all landowners affected, setting forth the details of the contemplated work, the cost to each, how and where the contribution is to be paid, and other pertinent information. If there are objections on the part of landowners regarding contributions, location, or details of design, an effort should be made to effect necessary adjustments.

The fixing of contributions is to be handled entirely by officers of the association. It is important that such officers maintain a complete record of contributions, showing acres of land assessed, legal

description of tract, amount of assessment, date of payment, and how made (whether cash, check, or otherwise). Rights-of-way should be recorded as a part of the record.

After the money has been raised and deposited in escrow, the preparation of a working agreement between the mutual drainage association and the soil conservation district is undertaken. Specifications and bid proposals are prepared and prospective contractors invited to bid on the job. Contract is awarded by association officers to the lowest reputable bidder. It will be necessary to call a third meeting of the association, if the authority to award contract was not delegated to the association officers. The job is then staked by technical representatives of the soil conservation district and the contractor goes to work.

If a Government dragline is furnished to the soil conservation district, there will be no bidding or letting of contract. Payment in such case is made by the drainage association to the soil conservation district on a yardage or hourly basis, as set up by the district governing body.

While mutual drainage associations are organized to take care of immediate drainage needs, consideration should be given to making them permanent organizations because they can be used to good advantage to provide periodic maintenance to drainage systems.

Because of the variance in State and local conditions, the general procedure for the formation of mutual drainage associations must be adapted to each case. Justification for mutual drainage associations will depend upon the flexibility of State laws and the desire for mutual cooperation among farmers.

On the grain lands of the Pacific Northwest and of the Great Plains stubble mulch farming has found wide acceptance. Few recent agricultural innovations have traveled so far or so fast. Crop residues used as stubble mulch are effectively fighting wind damage on hundreds of thousands of acres in the "blow" States, and at the same time are conserving moisture, improving soil structure, and checking run-off. The practice is solidly established in the West as a standard soil-management measure.

The supervisors of the Papio Soil Conservation District, which includes Washington County, Nebr., believe that conserving human resources is as much a part of conservation farming as the conservation of soil and moisture.

Acting on that belief, and in view of the numerous serious accidents which have happened in the county, the supervisors erected the 10- by 24-foot signboard shown here.

The sign was erected on the highway over which the largest number of farmers travel on the way to Blair, the county seat. It is planned to change the wording in the panel on the left every 6 weeks or so.

Since this picture was taken, the supervisors have placed an 8-inch strip lettered "Buy War Bonds and Stamps" above the sign.

The Papio Soil Conservation District was the first to be organized in Nebraska, the referendum being held in February 1938. Its original area was 48,000 acres on the Papio Creek drainage, but it has since grown to include all the county. It is on the extreme eastern edge of Nebraska, a short distance north of Omaha.

WALNUT FOR GUNSTOCKS

(Continued from page 151)

The production of walnut logs from the farm forestry project in 1943 was more than 140 carloads for gunstock material, with the logs having been harvested in a manner that will assure still more walnut in the future. Indications are that production will continue at a good rate.

The Nebraska farm forestry project is doing much in the war by bringing buyer and seller together to the mutual advantage of both, saving manpower by getting walnut to market so that gunstocks can be made, and helping to safeguard the supply for future years.

SUPPLEMENTARY GLEANINGS FROM THE FIELD OF HYDROLOGY

By Clarence S. Jarvis. 90 pages; 21 figures; 14 tables.

Privately printed and available in a limited edition, this data-packed handbook for hydrologic technicians marks the culmination of many years of investigations by the author, a distinguished engineer-scientist formerly of the staff of the Soil Conservation Service. It is an assembly of basic and background or related data on which was developed the methodology employed in recent technical papers published mainly in the "Transactions of the American Society of Civil Engineers" and "Transactions of the American Geophysical Union."

It is reported that the methodology used by Dr. Jarvis has been put to practical test in defining the runoff characteristics of river systems within prospective invasion areas overseas.

For REFERENCE

Compiled by ETTA G. ROGERS, Publications Unit

Field offices should submit requests on Form SCS–37, in accordance with the instructions on the reverse side of the form. Others should address the office of issue.

OFFICE OF INFORMATION
U. S. DEPARTMENT OF AGRICULTURE

Control of Mesquite on Southwestern Ranges. Leaflet No. 234. Southwestern Forest and Range Experiment Station, Forest Service, U. S. Department of Agriculture. October 1943.

Disease-Resistant and Hardy Oats for the South. Farmers' Bulletin No. 1947. Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture, October 1943. 5¢.[1]

Diseases of Sheep and Goats. Farmers' Bulletin No. 1943. Bureau of Animal Industry, Agricultural Research Administration, U. S. Department of Agriculture. September 1943. 10¢.[1]

Effectiveness of Wood Preservatives in Preventing Attack by Termites. Circular No. 683. Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture. September 1943. 10¢.[1]

Farm Adjustments and Income on Typical Corn Belt Farms. Circular No. 688. Bureau of Agricultural Economics, U. S. Department of Agriculture. November 1943. 10¢.[1]

Farm Bookkeeping and the Federal Income Tax. Bureau of Agricultural Economics and Extension Service, U. S. Department of Agriculture. Revised October 1943.

Fertilizer Consumption in 1941 and Trends in Usage. Circular No. 689. Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture. October 1943.

The Hessian Fly and Its Control by Late Sowing of Wheat in Oklahoma and Arkansas. Circular No. 687. Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture. November 1943. 5¢.[1]

Kitchen Intruders: Why Tolerate Them? AWI–70. Extension Service and Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture. October 1943.

Life History and Control of the Tomato Pinworm. Technical Bulletin No. 841. Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture. September 1943. 10¢.[1]

Negro Farmers in Wartime Food Production. The Farmer and the War—No. 6. U. S. Department of Agriculture. October 1943. 5¢.[1]

Preventing Damage to Commercial Dried Fruits by the Raisin Moth. Leaflet No. 236. Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture. October 1943. 5¢.[1]

Preventing Insect Damage in Home-Dried Fruits. Leaflet No. 235. Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture. October 1943.

Protect Home-Cured Meat from Insects. AWI–32. Extension Service and Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture. October 1943.

Range and Livestock Production Practices in the Southwest. Miscellaneous Publication No. 529. U. S. Department of Agriculture and Department of the Interior, with the cooperation of the New Mexico College of Agriculture and Mechanic Arts and the University of Arizona. November 1943. 10¢.[1]

A Summary of the Literature on Milkweeds (Asclepias Spp.) and Their Utilization. Bibliographical Bulletin No. 2. U. S. Department of Agriculture Library. October 1943. 10¢.[1]

STATE BULLETINS

Better Sires will Increase Egg Production. Circular No. 31. Agricultural Experiment Stations, Louisiana State University and A. & M. College, Baton Rouge, La. June 1943.

Biology and Control of the Turnip Aphid. Bulletin No. 365. Agricultural Experiment Stations, Louisiana State University and A. & M. College, Baton Rouge, La. June 1943.

Classification of Fruit Bud Development on Peaches and Nectarines and Its Significance in Cultural Practice. Bulletin No. 706. Agricultural Experiment Station, Rutgers University, New Brunswick, New Jersey. July 1943.

Conservation and Use of Poultry Manure. Press Bulletin No. 520. Agricultural Experiment Station, University of Florida, Gainesville, Fla. July 1943.

Farm and Family Incomes and Expenses of Low-Income Farm Families in Indiana. Bulletin No. 485. Agricultural Experiment Station, Purdue University, Lafayette, Indiana. July 1943.

Farmers' Response to Production Goals in Four Selected Areas of South Carolina. Bulletin No. 347. Agricultural Experiment Station, Clemson Agricultural College, Clemson, South Carolina. October 1943.

Fattening Steers on Winter Pasture with Ground Snapped Corn, Ground Shallu Heads, Molasses and Cottonsed Meal. Bulletin No. 391. Agricultural Experiment Station, University of Florida, Gainesville, Fla. August 1943.

Feeding Dairy Stock in War Time. Buletin No. 263. Agricultural Experiment Station, University of Wyoming, Laramie, Wyo. September 1943.

Greenhouse Studies of the Toxicities of Oklahoma Salt Contaminated Waters. Technical Bulletin No. T–20. Agricultural Experiment Station, Oklahoma A. & M. College, Stillwater, Okla. October 1943.

The Influence of Protein Concentrates Upon the Quality of Meat in Turkeys. Bulletin No. 264. Agricultural Experiment Station, University of Wyoming, Laramie, Wyo. September 1943.

Insects Attacking Blueberry Fruit. Circular No. 472. Agricultural Experiment Station, Rutgers University, New Brunswick, New Jersey. August 1943.

Locating and Preparing Fields for the Cultivated Blueberry. Circular No. 473. Agricultural Experiment Station, Rutgers University, New Brunswick, New Jersey. August 1943.

Oats as a Feed for Beef Cattle. Bulletin No. B–270. Agricultural Experiment Station, University of California, Berkeley, Calif. October 1943.

Recommendations for the Use of the Approved Grades of Fertilizer for Texas in 1943–44. Circular No. 102. Agricultural Experiment Station, Tex A. & M. College, College Station, Texas. October 1943.

Relationship Between Fat Content of Dairy Grain Mixtures and Milk and Butterfat Production. Bulletin No. 644. Agricultural Experiment Station, Wooster, Ohio. August 1943.

Soft Corn for Fattening Livestock. Circular No. 48. Agricultural Experiment Station, South Dakota State College, Brookings, S. Dak. September 1943.

Suggested War-Time Feeds for Chickens. Circular No. 71. Agricultural Extension Service, Gainesville, Florida, with the cooperation of the U. S. Department of Agriculture. September 1943.

Synthetic Manure. Circular No. 470. Agricultural Experiment Station, Rutgers University, New Brunswick, New Jersey. August 1943.

[1] From Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Winter scene on the farm of Albert Holm, Spring Grove, Minn. From these white oak logs will come sturdy posts for a fence protecting the woodlot. There's no gap in the calendar of soil conservation activity. (Photo by G. V. Gideon of the Soil Conservation Service.)

U. S. GOVERNMENT PRINTING OFFICE: 1943